inlet to said conduit connected to a source of diluent gas, said process gas supply furnishing a reactive process gas, whereby said reactive process gas is dissociated in said process region while being swept away by diluent gas in said plasma current of said torroidal path so as to reduce residence time of the reactive process gas.

27. The plasma reactor of Claim 1 further comprising an RF bias power supply coupled to said wafer support capable of maintaining a plasma sheath over a workpiece on said workpiece support of a thickness which constricts said closed torroidal path so as to enhance plasma ion density in a process region overlying said workpiece support.

28. The plasma reactor of Claim 1 further comprising an RF bias power supply coupled to said wafer support.

30. The plasma reactor of Claim 21 further comprising:

a first magnetic core extending between said conduit and said enclosure across at least a portion of a first half of said width, said coil antenna comprising a first winding surrounding said first magnetic core;

a second magnetic core extending between said conduit and said enclosure across at least a portion of a remaining half of said width, said coil antenna further comprising a second winding wound surrounding said second magnetic core.

11 ~~31~~ 10. The plasma reactor of Claim ~~30~~ wherein said first and second magnetic cores are longitudinally movable toward and away from a center locus overlying a center of said wafer support, whereby to enable adjustment of plasma ion density near the

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center of said workpiece support relative to plasma ion density near a periphery of said wafer support.

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13 ~~32~~. The plasma reactor of Claim 10 ~~30~~ wherein said first and second windings are closely wound around said first and second magnetic cores respectively.

33. The plasma reactor of Claim 31 wherein said first and second windings comprise a continuous winding having first and second portions around said first and second magnetic cores respectively.

34. The plasma reactor of Claim 1 wherein said vacuum enclosure comprises a longitudinal side wall and an overlying lateral ceiling, and wherein said first and second openings extend through said ceiling.

35. The plasma reactor of Claim 1 wherein said vacuum enclosure comprises a longitudinal side wall and an overlying lateral ceiling, and wherein said first and second openings extend through said side wall.

36. The reactor of Claim 1 wherein said conduit is elongate and tubular of a cross-sectional shape that is one of curved or rectangular, said first and second openings mating with respective ends of said conduit.

37. The reactor of Claim 30 wherein said conduit has a smaller cross-sectional area at an intermediate portion thereof than at its ends.

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